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BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

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FOREST INSECT SURVEY

EASTERN LASSEN AREA, LASSEN NATIONAL FOREST, CALIFORNIA

Season of 1941

Annex 1
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By
Philip C. Johnson
Berkeley, California
February 14, 1942

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Forest Insect Laboratory
Berkeley, California
February 14, 1942

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APPROVED BY:

J. M. MILLER
Senior Entomologist, In Charge

SUBMITTED BY:

PHILIP C. JOHNSON
Assistant Conservationist

FOREST INSECT SURVEY
EASTERN LASSEN AREA, LASSEN NATIONAL FOREST, CALIFORNIA
Season of 1941

INTRODUCTION

The annual forest insect survey of the Eastern Lassen Area was made during the period October 23 to November 7, 1941. Bark beetles continue to be the primary insect enemy of the coniferous forests in this area. No other form of insect damage was apparent. The severity of the current infestation was estimated from a series of 11 320-acre sample plots in virgin stands. Current losses in cutover pine stands were examined by reconnaissance methods only since it was not possible to examine the seven cutover sample plots this season.

The survey field party included Junior Scientific Aide W. M. Bennett, Assistant Field Aide R. L. Tweedie, and the writer. Mr. Tweedie entered the Army Air Corps a few days before the survey was completed and his place was filled by Junior Entomologist J. W. Johnson. The expenses of the survey including the salaries of the temporary men were largely defrayed by the Forest Service.

Large-scale logging operations were begun during the summer of 1941 by the Red River Lumber Company west and north of Black's Mountain. It is probable that two 320-acre sample plots (L-1, L-14, see map) will be cut in this operation before the 1942 insect survey is made. Another plot, L-7, also appears to be in the path of cutting operations of the Fruit Growers Supply Company. Considering the cutting program which the Red River interests have planned for the next few years in the western part of the reporting area, it is inevitable that some curtailment of the sample plot system will be necessary. However, losses from beetles in several portions of the reporting area are not now adequately sampled and the loss of the above sample plots could be offset somewhat by establishing new samples in these unsampled areas which include parts of the Stephens Ranch, Merrill Flat, and Dixie Valley entomological units.

The cutover acreage accumulated between 1937 and 1940 inclusive has been obtained, and the necessary corrections made in the virgin timbered acreage of the entomological units shown in Table 4.

CHARACTER OF 1941 INFESTATION

Perhaps the most conclusive observation obtained from the survey data was the pronounced decrease in the rate of mortality in 1941. In general, the pine mortality in 1941 was only about 40 percent of that recorded in the previous year, or a decline from 124 board feet per acre

in 1940 to approximately 40 board feet per acre. These figures include both ponderosa and Jeffrey pine together. Jeffrey pine alone showed a similar drop (Table 2) from an average mortality in 1940 of 62 board feet to an estimated 27 board feet in 1941.

Total beetle-caused destruction of pine timber is still considerable in the Eastern Lassen Area. The 1940 loss from this source is shown in Table 4 to have been estimated at 36,432,000 board feet and in 1941 the loss is estimated to be 12,196,000 board feet for the entire year on the 295,000 acres covered in the survey.

A comparison of the average board-foot volume of ponderosa and Jeffrey pine trees attacked in 1940 and 1941 is interesting.

Comparison of Average Tree Volume Attacked in 1940 and 1941

	1940	1941
Ponderosa pine	1,126 b.m.	1,219 b.m.
Jeffrey pine	1,936 b.m.	1,199 b.m.

Usually an increase in the average volume of ponderosa pine trees attacked by beetles has accompanied a decrease in the infestation and a trend toward the return to endemic mortality. It is not known whether this applies also to Jeffrey pine, but, at any rate, the above comparison has shown a different reaction in the two species. The significance of this should be studied further since it may play an important role in determining the magnitude of infestations in stands where these two species occur together in varying proportions or by themselves.

The average ponderosa and Jeffrey pine tree attacked in 1941 was large and overmature, above the average diameter limit for its age, often previously top-killed from other insect attacks or lightning, or damaged by fire, or falling trees. While the crown condition had deteriorated beyond the point of accurate risk determination, it appeared that the vast majority of attacked trees were the less vigorous individuals in the stand and that greater selection had been shown by the beetles in singling out these trees for attack.

The attacks themselves appeared to be caused more by the interaction of several insect species rather than from the concerted effort of one or two species. Judged from the basal examinations made by the spotters, the western pine beetle, Dendroctonus brevicomis Lec., in ponderosa pine and the Jeffrey pine beetle, Dendroctonus jeffreyi Hopk, in Jeffrey pine were still predominant. These were often associated with bole attacks of the emarginate Ips beetle, Ips emarginatus Lec., and the California pine flatheaded borer, Melanophila californica Van Dyke. The Jeffrey pine beetle attacks in Jeffrey pine appeared particularly vigorous

in the basal region of the bole while the same region in infested ponderosa pines was often devoid of any attacks and the cambium of many of these trees was found instead to be in a souring condition.

Mortality from insects attacking white fir also showed a decline in 1941 (Table 3). Fir mortality was considerable at least on one plot (L-5) during 1940. Most of this damage was caused by two insect species, a fir engraver beetle, Scolytus ventralis Lec., and the roundheaded fir borer, Tetropium abietus Fall.

INFESTATION CONDITIONS BY UNITS

Areas of Higher Infestation

Pine mortality from beetle attacks has been estimated on 15 entomological units and on eight of these the estimated mortality for 1941 ranges from 50 to 84 board feet per acre.

Unit	1937 Pine Stand per Acre	1941 Pine Mortality (estimated) Per Acre	% of 1937 Stand
Halls Flat	8,261 b.m.	60 b.m.	0.72
Black's Mt.	15,781	59	0.37
Crater Mt.	16,098	51	0.32
Harvey Valley	14,110	84	0.60
Gordon Valley	13,069	61	0.47
Cave Mt.	11,446	60	0.52
Logan Mt.	19,319	57	0.30
Brockman Flat	2,799	49	1.75

Of all the above units Harvey Valley and Brockman Flat appear to deserve immediate attention. In a year when the average mortality for all the Eastern Lassen Area is estimated at only 40 board feet per acre, the loss of 84 board feet in the Harvey Valley unit shows that there apparently are some conditions present which make it difficult to lower the mortality to a satisfactory level even in those years when the infestation is at a low ebb. Some factors which may contribute to this situation may be (1) the predominance of southern exposures which, in this locality, seem to be associated with higher beetle hazard, and (2) abundance of high risk trees in the unit, estimated to contain between 3,000 and 4,000 board feet per acre.

The high percentage of stand mortality in the Brockman Flat unit is at present rather alarming because of the small stand per acre. The merchantability of the stand is now in a somewhat precarious status because of the low volume per acre. Further depletion by beetles may erase all possibility of utilizing the stand for saw timber.

Areas of Lower Infestation

In seven units in the Eastern Lassen Area the 1941 beetle-caused pine mortality declined to very favorable levels.

Unit	1937 Pine Stand per Acre	1941 Pine Mortality (estimated) Per Acre	% of 1937 Stand
Bogard Buttes	16,057 b.m.	23 b.m.	0.14
Stephens Ranch	15,043	37	0.25
Butte Creek	15,008	46	0.31
Nigger Spring	10,750	15	0.14
Beaver Creek	8,992	15	0.17
Straylor Lake	10,356	33	0.32
Coble Mt.	5,699	13	0.23

In practically all the above units the 1941 mortality has reached the lowest point in recent years both from the standpoint of volume per acre and of the percentage of the stand. Inasmuch as four of these units comprise high hazard fringe stands it is possible that this condition is transitory and depends to a large extent upon current favorable climatic factors.

RECOMMENDATIONS

Direct control measures are unwarranted anywhere in the reporting area because of the current decline in the infestation and the doubtful value of the method under eastside conditions.

Indirect control by means of sanitation-salvage logging is recommended for much of the remaining virgin pine in the Harvey Valley Unit if this timber is not to be fully utilized within the next five years. A considerable high risk volume is available for removal under this plan and, if done, should result in limiting much of the annual mortality from beetles.

Perhaps the greatest need now is for the utilization of the very high hazard (Hazard V) areas in the Coble Mountain, Beaver Creek, Dixie Valley, Cave Mountain, and Brockman Flat Units. In most of these units the stands are relatively sparse. They are also a source of low quality lumber now much in demand by the pine lumber markets. In view of the favorable lumber prices for lower grades it seems very desirable to cut these stands heavily now rather than wait until some future date when the lack of a suitable market may prevent the economical harvesting of this

timber. Prompt cutting now would salvage the remaining timber values which are certain to diminish if the stands are allowed to remain untouched. Based upon present knowledge it does not appear likely that the removal of high risk trees alone in high hazard fringe stands is sufficient guarantee that the beetle problem will be eliminated. Therefore the maximum salvage of these high hazard fringe stands can best be accomplished by heavy cutting -- probably 65 percent or more -- and not by a light sanitation- salvage cutting. It is hoped that serious consideration will be given to this proposal by those charged with the management of these fringe stands. Perhaps no other time is so opportune as the present to accomplish in one operation both the utilization of this timber and the removal of a potent source of infestation to adjacent stands.

TABLE 1. MORTALITY OF PONDEROSA AND JEFFREY PINE FROM BARK BEETLE ATTACKS ON SAMPLE PLOTS EASTERN LASSEN AREA, LASSEN NATIONAL FOREST AND VICINITY, CALIFORNIA
1940 - 1941

Entomological Unit	Sample		Total 1940 Pine Loss				Cruised 1941 Pine Loss			
			Per Section		B.m.	% of	Per Section		B.m.	Probable %
	Plot No.	Timbered Acreage	No. of Trees	Volume b.m.	Per Acre	1939 Loss	No. of Trees	Volume b.m.	per Acre	of Total 1941 Loss
Blacks Mountain	L-1	320	42	48,460	76	146	30	37,540	59	80
Harvey Valley	L-3	320	142	177,560	277	233	34	42,180	66	79
Crater Mountain	L-5	320	104	122,680	192	155	18	26,380	41	80
Nigger Spring	L-6	320	44	42,560	67	118	8	3,780	6	79
Gordon Valley	L-7	320	52	53,440	84	129	24	35,660	56	82
	L-8	320	36	55,940	87	70	26	26,740	42	77
Brockman Flat	L-10	320	74	37,080	58	62	24	25,300	40	77
Bogard Buttes	L-11	320	86	109,020	170	152	6	11,380	18	82
Butte Creek	L-12	320	30	67,580	106	168	18	25,060	39	84
Beaver Creek	L-13	320	42	38,220	60	120	10	9,180	14	79
	L-14	140	46	78,445	123	141	5	6,190	10	81
Average			63	75,544	118	136	18	22,670	36	80

TABLE 2. MORTALITY OF JEFFREY PINE FROM BARK BEETLE ATTACKS ON SAMPLE PLOTS EASTERN LASSEN AREA, LASSEN NATIONAL FOREST AND VICINITY, CALIFORNIA

Entomological Unit	Sample		Total 1940 Loss				Cruised 1941 Loss			
			Per Section		B.m.	% of	Per Section		B.m.	Probable %
	Plot No.	Timbered Acreage	No. of Trees	Volume b.m.	per Acre	1939 Loss	No. of Trees	Volume b.m.	per Acre	of Total 1941 Loss
Harvey Valley	L-3	320	34	44,280	69	279	10	5,660	9	79
Gordon Valley	L-7	320	14	20,520	32	143	8	15,500	24	82
Butte Creek	L-12	320	22	54,820	86	343	14	21,340	33	84
Average			23	39,870	62	255	11	14,170	22	82

TABLE 3. SPECIES OTHER THAN PINE KILLED BY BARK BEETLES ON VIRGIN SAMPLE PLOTS EASTERN LASSEN AREA, LASSEN NATIONAL FOREST AND VICINITY, CALIFORNIA
(Per Section Basis)

Plot	Tree Species	Total 1939		Total 1940		Cruised 1941*	
		Number Trees	Volume b.m.	Number Trees	Volume b.m.	Number Trees	Volume b.m.
L-1	White Fir	2	880				
L-5	White Fir	20	52,900	70	106,720	4	12,840
L-8	White Fir	14	17,760	14	8,660	2	400
	Incense Cedar			2	1,600		
L-10	White Fir	8	4,240	18	18,160	4	3,880
	Incense Cedar	2	1,220			2	260
L-13	Incense Cedar	2	120				
L-14	White Fir	18	11,008	4	480	4	1,840

* Approximately 80 percent of total expected loss for 1941.

TABLE 4. VIRGIN PINE TIMBER KILLED BY BARK BEETLES
EASTERN LASSEN AREA, LASSEN NATIONAL FOREST, CALIFORNIA
1940-1941

Entomological Unit	Virgin Timbered Acreage*	Total 1940 Loss		Cruised 1941 Loss		
		No. of Trees	Volume m.b.m.	No. of Trees	Volume m.b.m.	Probable % of Total 1941 Loss
Bogard Buttes	25,200	3,390	4,295	240	448	80
Stephens Ranch	27,760	4,120	5,019	520	819	81
Butte Creek	27,260	1,280	2,879	770	1,068	84
Halls Flat	11,320	640	1,027	420	554	82
Nigger Spring	14,830	2,040	1,970	370	175	79
Beaver Creek	27,550	1,890	2,508	340	331	80
Blacks Mountain	21,120**	2,770	3,306	920	1,105	88
Crater Mountain	11,790	1,910	2,257	330	485	80
Harvey Valley	14,130	3,140	3,924	750	932	79
Straylor Lake	28,660	1,840	3,010	720	738	79
Gordon Valley	34,220	2,350	2,926	1,340	1,669	80
Cave Mountain	17,460	1,720	1,236	660	832	80
Logan Mountain	2,060	250	227	70	93	79
Coble Mountain	21,040	1,410	1,329	300	213	79
Brockman Flat	10,590	1,220	612	400	417	79
Totals	294,990	29,970	36,525	8,150	9,879	81

* As of January 1, 1941. The virgin pine acreage of the three units from which no loss data are available include Merrill Flat 16,240 acres, Campbell Butte 10,770 acres and Dixie Valley 17,450 acres.

** Does not include 9,130 acres in the Black's Mountain Experimental Forest.

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FOREST INSECT HAZARD INVENTORY
HAZARD CLASSIFICATION

EASTERN LASSEN AREA
SHASTA AND LASSEN COUNTIES, CALIFORNIA

1937